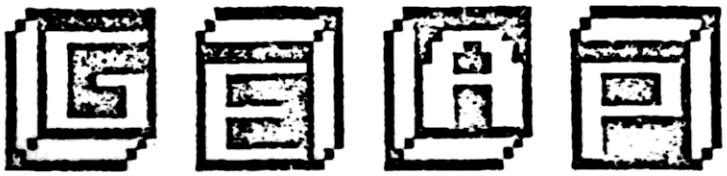
GRAPHICS EDITOR AND PROGRAMMER
INSTRUCTION MANUAL

J F Consulting
74355 Buttonwood
Palm Desert, CA 92260
(714) 340-5471



INTRODUCTION TO GEAP MANUAL

It should be noticed that this manual is in two parts. The first part acquaints the user with the regular GEAP commands. The second part contains the "extra", "advanced", commands associated with the GEAP 48K version.

After learning how to get in and out of the various elementary commands, you may wish to read Section(s) 5.0-5.3. This will show you an easier method of saving screen drawings.

"Newscript" users will find instructions to combine GEAP with word-processing at 11.0 in the GEAP/48k Manual.

INSTRUCTIONS FOR 48K GEAP DISK USERS

Your GEAP program(s) are distributed on a formatted TRSDOS disk. (If you are a Model III owner, you will have to use the CONVERT command).

SINGLE DRIVE OWNERS

Due to our respect for copyright laws, we must distribute GEAP on a formatted disk. If you have a friend with two drives, you might ask them to transfer the program(s) to a TRSDOS for you.

If this option is unavailable to you we offer the following alternatives:

1. Send us a copy of your TRSDOS and we will make the transfer for you, or
2. Request that we send you the program on cassette, or
3. Send us $15 (in addition to the price of GEAP) and we will send you a TRSDOS and GEAP on a copy of the TRSDOS that you are purchasing.

MAKING A BACKUP COPY

We strongly suggest that you make a backup copy of this disk before continuing.

1. Insert a system disk into drive 0. Insert the GEAP formatted disk in drive 1. Now type : BACKUP
2. Insert a blank disk in drive 0. For source disk, specify 1, for destination specify 0.

After the backup has been completed, you are now ready to start using GEAP. Re-insert your system disk and go to BASIC. Type RUN "GEAP" and start reading the instructions in section 1.1. One word of caution. DO NOT try to make a copy of GEAP AFTER you have used the "RUN" command. A copy made using the "SAVE" command after GEAP has been run will not work. If attempting to use this method, use the "LOAD" command when in BASIC and then immediately use the "SAVE" command.

PROGRAM NAMES ON YOUR DISK

The following programs are on your GEAP disk:

```
GEAP ..............Main Program
EXPMD1.............Expansion Module 1
EXPMD2.............Expansion Module 2 - Med. Letter Set
EXPMD3.............Expansion Module 3 - Large Letter Set
EXPMD4.............Expansion Module 4 - Cube Letter Set
EXPMDP1............Expansion Module 5 - Epson MX-80 printer support
SCRIPMOD...........NEWSCRIPT Save or Load File Module
```

Table of Contents

		Page
1.0	Introduction	1
1.1	Preliminaries	2
2.0	Elementary Commands - Modes	2
2.1	Elementary Commands - Regular Mode	2
2.2	Elementary Commands - Print Mode	3
2.3	Elementary Commands - Keypad Mode	5
2.4	Elementary Commands - Designate Mode	6
2.5	Compressed Code, Non-Compressed Code and Storage Formats	6
2.6	Long Term and Temporary Storage	7
3.0	Intermediate Commands - Keypad Mode	8
3.1	Designate Mode - Fill In Option	8
3.2	Designating a Figure	9
3.3	Moving the Designated Figure	9
3.4	Menu Options 4-8	9
3.5	Storage of Designated Figure	10
3.6	Menu Option 2: Store Figure in Basic String	10
3.7	INPUT Statements	11
3.8	Loading Pictures For Re-Editing	12
4.0	Advanced Commands and Fine Points - Marking Off the Screen	12
4.1	Merging Pictures	13
4.2	16K Memory and Storage Overflow	13
4.3	Delay Loops	13
4.4	Location 1023 and the Screen Edges	14
4.5	Menu Options 1 and 2 Compared	14
4.6	Creating Your Own GEAP Expansion Modules	14
Appendix - Merging Two Basic Programs		16
Summary of Commands		18

1.0 INTRODUCTION

GEAP is a program, written in BASIC, that is part text editor, part screen drawing utility, and part BASIC program creator.

GEAP has a library of commands that allows you to make intricate screen drawings and formats. When you are finished with your drawing, GEAP can write a BASIC program that will reproduce the drawing. This program can be recorded, and then merged with another program or run by itself. You can specify how the program is written. It can be in compressed code for minimum storage space and fastest execution. It can be in non-compressed code for easy editing or compiling. Or, you can save part of the screen in String Format for animation with PRINT@ statements. You can store several drawings and record them all at once.

GEAP's command library includes:

Editing Flashing cursors controlled by arrows allow you to draw and erase using single dots, graphics symbols, or alphanumeric symbols. Or, you can construct your own "paintbrush".

Coordinates This command tells you where the cursor is located on the screen, giving X and Y coordinates and PRINT@ location.

Re-editing You can load the BASIC program created by G E A P (or almost any other BASIC program that draws a picture) into GEAP for re-editing.

Move Entire Screen Move the complete screen image up, down, left or right.

Magnify, Rotate, Tilt, Shrink/Expand, Draw Symmetrical Views You can designate part of the screen to be rotated, magnified, etc.

Fill In or Reverse Designated Part of Screen You can draw an outline and have the computer fill it in with a specified graphics character, or reverse the black and white areas within it. The outline doesn't have to be a rectangle. It can be irregular and even have holes in it.

Store Screen In Memory You can store your drawing in a temporary buffer so that you can experiment with changes and still be able to restore the original.

Move/Store Designated Figure You can mark off part of the screen to be moved and stored independently of the rest of the drawing. You can merge this figure with a previously stored picture.

Add INPUT Statements You can allow for keyboard response when the program created by GEAP is run. A special control character (the quote mark) will cause GEAP to insert INPUT statements in the proper places when it writes your BASIC program.

MERGE TWO DRAWINGS You can draw a picture and then combine it with a previously stored picture.

Graphics Keypad Graphics symbols are constructed directly from the keyboard. You don't have to know any graphics codes, or even what graphics codes are.

Expansion Experienced programmers can add their own customized BASIC expansion modules to GEAP. A special expansion module format allows you to add a library of your own symbols, drawings, or subroutines.

1.1 PRELIMINARIES

As with any tool, to get the best usage out of it you will have to spend some time learning how to use it properly. The instruction manual is divided into beginning, intermediate, and advanced sections. Go through each section and familiarize yourself with the commands. When you feel comfortable with a section, move to the next.

LOADING AND MAKING A BACKUP COPY OF GEAP

If you are using a Model III, set your cassette speed to low. To load GEAP, prepare your cassette, type in CLOAD and press the ENTER key. (If using disk, goto Basic and be sure to use the CMD "T" before loading from casette. After GEAP has been placed on disk, you may then use the RUN command). When the cassette stops and the READY appears on the screen, check that you have had a good load. To do this, type in LIST 3201 and press the ENTER key. The screen should read: 3201 REM22F940C9

If you want to make a backup copy of GEAP, you should now put a blank tape in the recorder, press the Record and Play buttons, type in CSAVE, and press the ENTER key. (If you are using disk, use the SAVE command. If you are using Stringy Floppy, use the &SAVE command.) Make your copy BEFORE you enter RUN. A copy made after you enter RUN will not work.

This copy is for your personal use. Please don't give free copies to your friends. If they like the program, encourage them to buy their own copy.

After you've made your copy, type in RUN and press the ENTER key. GEAP'S emblem will appear and then a dot will begin to flash. GEAP is now ready for your commands. The list of commands begins in the next section.

IMPORTANT NOTE: GEAP changes your memory size setting as well as some other internal parameters. Reset or reboot your computer before re-loading GEAP or any other BASIC programs.

2.0 ELEMENTARY COMMANDS MODES

GEAP has four modes. Each mode has its own set of commands and its own flashing indicator:

Regular Mode.....flashing dot (.)
Print Mode.....flashing asterisk (*)
Keypad Mode.....flashing less than (<)
Designate Mode.....flashing minus (-)

2.1 ELEMENTARY COMMANDS IN REGULAR MODE

When you CLOAD and RUN GEAP, you will see GEAP'S emblem and then a flashing dot will appear. The flashing dot indicates that you are in GEAP's Regular Mode. We will list the elementary commands for the Regular Mode and then discuss each command.

REGULAR MODE ELEMENTARY COMMANDS

Arrow(s).....Move flashing dot in indicated direction. Erases as it moves.
'Shift' and Arrow(s)..Draw line in indicated direction.
'Clear'.....Clear the screen
';' and Enter.....Record drawing on screen to memory.
';' and Spacebar.....Load drawing stored in memory to screen.
'9'.....Call up menu of further options.
'<'.....Go to Keypad Mode.
'-'.....Go to Designate Mode.
'*'.....Go to Print Mode.

EXAMPLES:

1) The first thing to do when you see the flashing dot is to hold down the various arrow keys and notice how the dot moves. You may hold down more than one arrow at the same time, although for some combinations, such as the up and down arrows, the results are not too exciting.

2) Next, draw a few squiggles by holding down one or more arrows and the 'Shift' key.

3) Now erase one of the squiggles. To do this, move the flashing dot over the squiggle without holding down the 'Shift' key.

4) Now let's store the remaining squiggles in memory. To do this, hold down the ';' and 'Enter' keys for a moment. The computer will print "Recording" on the screen. Then your picture will return.

5) Now test that the picture is really stored in memory. Hit the 'Clear' key to clear the screen. Hold down the ';' key and spacebar and your picture will return to the screen. The picture will remain stored in memory until you record a new one with the ';' and 'Enter' keys. (There is a rare exception. See "16K Memory and Storage Overflow" in the advanced section. If using Expansion Modules, also see Expansion module warnings and precautions).

6) Now let's have the computer write a BASIC program which will reproduce the picture on the screen. Hold down the '9' key for a moment and a list of options will appear. Choose option 1, "Store screen in PRINT statements", by hitting the "1" key.

7) The computer will tell you the number of bytes available for storing your program. This number varies with your memory size, and with the number of programs you have already stored. The computer will also tell you the last line number it has used. If you haven't stored any programs yet this number will be zero. (This number is reset to zero every time you dump the stored programs. See step 11 below.) The computer will ask you for an initial line number. Type in a number, say 10, and hit the 'Enter' key.

8) The computer will ask you if you want compressed code. For now, it does not matter whether you hit the 'Y' or 'N' key. Hit either one.

9) The computer will take a split-second to write the program, and then it will print the number of bytes left in storage. If you record the numbers before and after your program is stored, you can see how much memory it uses.

10) Now your picture will reappear on the screen. At this point you may be saying to yourself, "I'm supposed to have a program stored somewhere. Where in tarnation is it?" Don't worry. You can look at your program (and record it) any time you wish. After you record it, you don't even have to reload GEAP. Let's look at it.

11) Hit the '9' key again to bring back the menu of options. This time choose option '3', "Dump Storage", by hitting the "3" key. The computer will print "READY FOR RECORDING", and then a second "READY" will appear. Your program is now available in memory just as if you had typed it in yourself. To test it type in 'RUN' and hit 'ENTER'; your picture will appear just as you drew it. If you wish, you may now CSAVE the program on cassette. (Or SAVE it on disk, or @SAVE it on Stringy Floppy.) You may also wish to LIST it. (For compressed code the listing will look a little strange.)

12) You can now reactivate GEAP without reloading. Type in:

```
PRINT USR(4) : RUN
```

and then hit the 'Enter' key. The flashing dot will reappear.

13) Except for the commands for going to GEAP's other modes, this completes the elementary commands available in GEAP's Regular mode. You might want to practice them for awhile and then take a break before going to another of GEAP's modes.

2.2 ELEMENTARY COMMANDS IN PRINT MODE

The Print Mode is the simplest of GEAP's modes. To get into this mode hit the key containing the * (asterisk) symbol. If you were in the regular mode, the flashing dot will be replaced by a flashing * sign.

PRINT MODE ELEMENTARY COMMANDS

Arrow .....Move one space in indicated direction.
'Enter'.....Go to center of current line.
@ and Arrow(s).....Move in indicated direction to corner or edge of screen.
@ and 'Enter'.....Move to center of screen.
'Clear'.....Go to Keypad Mode.
'Shift' and Arrow.....(Model I only) Print picture of arrow.
(Note: On some Model I's, you must press 'shift' and 'down arrow' and then hit 'Z' key to get picture of down arrow)
Any other symbol.....Print the symbol pressed and move to the right.

EXAMPLES:

1) Type a few symbols, numbers, letters, etc. Now use the arrows to move the flashing * sign over the symbols you've typed. Note that the flashing * sign does not erase anything.

2) What if you want to erase a symbol? Use the arrows to move the flashing * sign onto the symbol. Then hit the spacebar.

3) Note that hitting the 'Enter' key moves the flashing * sign to the middle of the line. This is used for centering words, titles, etc. on the screen.

4) Now hold down the @ key and then--still holding down the @ key--press an arrow, then release the arrow, and finally, release the @ key. The flashing * sign will reappear at the edge of screen pointed to by the arrow. If you hold down two arrows with the @ key, the cursor will reappear in the corner pointed to by the arrows. If you hold down the 'Enter' key with the @ key, the cursor will reappear in the center of the screen.

5) In two ways the Print Mode acts differently than the other modes. First, in any mode except the Print Mode, hitting the '9' key brings up the menu of options. (We've already seen this in the regular mode.) In the Print Mode, however, hitting the '9' key merely results in a 9 being printed on the screen. Second, you can go from one mode to any mode by hitting the proper key, except when in the Print Mode. There is only one way to get out of the Print Mode. You must hit the 'Clear' key to exit.

6) Hit the 'Clear' key now. The flashing * sign will be replaced by a flashing < (less than) sign. This is the symbol of the Keypad Mode. We will discuss the commands available in this mode in a minute, but first, let's test the statements in (4) above.

7) Hit the '9' key. The same list of options that we called up from the Regular Mode will appear. This time let's choose the simplest option of all, the "Cancel" option. Hit the '9' key. The picture you had before calling the menu will reappear.

8) Now let's go from the Keypad Mode to the Regular Mode. To do this, hit the period key. The flashing < sign will be replaced by the flashing dot. You can try a few of the Regular Mode commands to convince yourself you're back in the Regular Mode.

9) Now let's go from the Regular Mode directly to the Keypad Mode. Hit the key containing the < symbol. The flashing < symbol will reappear.
Let's now examine the Keypad Mode.

2.3 ELEMENTARY COMMANDS IN KEYPAD MODE

Here is the list of elementary commands. You may notice something a little strange about the list.

KEYPAD MODE-ELEMENTARY COMMANDS

```
Arrow(s).............Move flashing < in indicated direction.
'Spacebar'...........Draw horizontal line through flashing < sign.
'Enter'..............Print flashing < sign's column number, row number,
                     and PRINT@ location.
'/' and Arrow........Move entire screen in indicated direction.
'9'..................Call up the menu.
'.' (period).........Go to Regular Mode.
'*'..................Go to Print Mode.
'-'..................Go to Designate Mode.
```

The strange thing about this list is that it contains no mention of the word "keypad". This is because all commands concerning the "keypad" are intermediate commands; they will be covered in Secton 3.

EXAMPLES:

1) Move the flashing indicator around the screen with the arrows. Note that it moves similarly to the flashing dot, except it flashes at a slower rate.

2) You may have noticed that it takes a long time to draw a horizontal line across the screen using the Regular Mode. To remedy this, we've included a horizontal line command in the Keypad Mode. Just hold down the spacebar, and a horizontal line will be drawn through the flashing < sign.

3) Now hold down the 'Enter' key. In the upper left corner you will see the flashing < sign's column number (X coordinate); in the middle you will see the sign's row number (Y coordinate); in the right corner you'll see the sign's PRINT@ location (X+64*Y). This command is useful for getting letters in the correct column or row: just move the < sign to the correct position -- checking the position with the 'Enter' key -- and then hit the '*' key to get the Print Mode; type in the desired letter or word, hit the 'Clear' key to bring back the Keypad Mode, move to the next desired location, etc. Or, you may have completed a drawing and want to know where to print a variable (with a PRINT@ command) when the drawing later becomes part of a BASIC program. Just move the flashing < sign to the spot where you want the variable to be printed, hit the 'Enter' key, and record the PRINT@ location for future use.

4) Now go back to the Regular Mode or the Print Mode, and put some squiggles, symbols, letter, etc on the screen. Return to the Keypad Mode. Now hold down the '/' (slash) key and an arrow. The entire drawing will move in the indicated direction. Note that you must hold down only one arrow at a time. Note also that any part of the picture that moves off the screen edge is lost. If you want to move a picture close to the screen edge, it's a good idea, before you move it, to go to the Regular Mode and record the screen to memory. That way if you lose part of it off the screen edge, you can return to the Regular Mode and bring back the original picture by hitting the ';' and the spacebar. You can also set your flashing cursor at the right edge of the screen for a position marker.

Except for the command for going to the designate mode, this completes the elementary commands for the Keypad Mode.

To go from the Keypad Mode to the Designate Mode, hit the '-' key. The flashing < sign will be replaced by a flashing '-' sign. You are now in the last of the four modes, the Designate Mode.

2.4 ELEMENTARY COMMANDS IN THE DESIGNATE MODE

The purpose of the Designate Mode is to mark off part of your drawing so you can operate on just the marked off part while leaving the rest of the drawing alone.

DESIGNATE MODE - ELEMENTARY COMMANDS

Arrow(s).....Move flashing '-' sign in indicated direction. Does not erase as it moves.

'Shift' and Arrow(s)..Mark location with a '+' sign and move in indicated direction.

'Enter'.....Record the part of the screen marked off by '+' signs and bring up new list of options.

'Clear'.....Erase '+' signs and start over again to mark off screen.

'9'.....Call up the usual menu of options.

'('.....Go to the Keypad Mode.

'.' (period).....Go to the Regular Mode.

'*'.....Go to the Print Mode.

EXAMPLE:

Let's go through an example of marking off a part of the screen.

1) If you don't already have lots of squiggles on the screen, go to the Regular Mode (by hitting the period key) and draw a lot of squiggles. Then return to the Designate Mode by hitting the '-' key.

2) Now let's mark off a rectangular part of the screen to operate on. Choose an imaginary rectangle on the screen so that some of your squiggles are inside and some are outside. Mark it off as follows: use the arrows to move the flashing '-' sign to one corner of the rectangle. Now use the 'Shift' key and an arrow to leave a '+' sign at the corner. (If you hold down the 'Shift' key too long, you may leave additional '+' signs on the screen. That's OK, don't worry about it.) Now move the flashing '-' sign to the diagonally opposite corner of the rectangle. If the first '+' sign was in the upper left corner, for example, then you now move to the lower right corner. Use the 'Shift' key and an arrow to leave a '+' sign in that corner. Now, move the flashing '-' sign anywhere inside the rectangle, just so it's not resting on a '+' sign. Hit the 'Enter' key. This completes marking off the rectangle.

3) When you hit the 'Enter' key, the screen will flash, and you'll be given a list of 5 options:

1=DESIGNATE, 2=FILL IN,-3=REVERSE, 4=MERGE, 5= CANCEL

Choose option 3, "Reverse", by hitting the '3' key. Your picture will return to the screen, but the black and white parts of the rectangle that you marked off will be reversed. (Letters and other non-graphics symbols will, however, be unchanged.)

4) We've covered a lot (at least I think so) and so we'll save the other options, "Designate", "Fill in", and "Merge" for later sections. (The "Cancel" we leave to the reader to investigate.) In a later section we'll also describe how to mark off figures more complicated that rectangles.

This completes the description of the elementary commands. You might want to practice with these for awhile, making pictures, for example, that contain squiggles drawn in the Regular Mode, letters entered in the Print Mode, and rectangles with black and white reversed, all in the same picture. Then you might want to save the picture in PRINT statements with option 1 of the menu.

2.5 COMPRESSED CODE, NON-COMPRESSED CODE AND STORAGE FORMATS

You might save a picture in both compressed code format, and non-compressed format, and compare the two. You'll find that compressed code usually uses fewer bytes than non-compressed code. Non-compressed code, on the other hand, can be edited with the regular BASIC editing commands. If you plan to make the picture part of a long BASIC program and may later want to change it a little bit, then it's best to save it in non-compressed code. Also, you may want to run the program through a compiler, and many compilers don't allow the

compressed code format.

If you store several pictures and record them all at once, how do you tell where one ends and the next begins? If you RUN them, the pictures will appear in rapid succession, and only the last will stay on the screen. Each picture, however, ends with a line that says REM END DUMP. The line number of the REM END DUMP is printed with the message LAST LINE NUMBER USED when you call option 1 of the menu. If you write down these line numbers then you will know where each picture ends. If you want the pictures to remain longer on the screen when you run them, replace each REM END DUMP line with a line like: FOR I = 1 TO 999 : NEXT which will cause a delay of 999 counts after each picture.

Sometimes the Basic READY message will cause part of your picture to scroll upward off the screen. To fix this, replace the line that says REM END DUMP with a line of the form 'nnnn GOTO nnnn'. For example if the last line in your picture-drawing program is 50 REM END DUMP, then type in 50 GOTO 50, and hit 'Enter.' Now RUN the program. The picture will remain on the screen until you hit the BREAK key.

A final word of caution. Don't use option 1 to store a picture that contains a "(quote) mark. Extra quote marks confuse PRINT statements. In fact, we've rigged GEAP so that it treats quote marks as special control characters. More about this in section 3.7

2.6 LONG TERM AND TEMPORARY STORAGE

Recall that you can put a picture in long term storage by going to the Regular Mode and hitting the ';' and ENTER keys. You can bring it back by going to the Regular Mode and hitting the ';' and spacebar. Now suppose you want to bring back the stored picture, but you don't want to lose the picture currently on the screen. Well, GEAP has another, temporary, storage area. A picture is placed in temporary storage when, for example, you call up the menu of options. And you can bring back a picture from temporary storage by going to the Regular Mode, holding down the SHIFT key, and then hitting the spacebar.

So we've sneaked in one extra command for the Regular Mode:

Shift and Spacebar.....Load temporary storage to screen

To bring back a picture from long term storage without losing the picture currently on the screen, you can:

1) Go to the Regular Mode by hitting the 'period' key.

2) Call up the menu by hitting the '9' key. Choose the Cancel option by hitting the '9' key again. The current picture is now in temporary storage.

3) Bring up the picture from long term storage by hitting the ';' and spacebar.

4) When you have finished looking at this picture, restore the current picture by holding down the SHIFT key and hitting the spacebar.

In section 4.1 we will see how to merge a picture in temporary storage with a picture in long term storage.

3.0 INTERMEDIATE COMMANDS IN KEYPAD MODE

First, let's describe the graphics keypad, which is used, logically enough, in the Keypad Mode. The graphics keypad is the six keys on the left side of the keyboard:

```
QW
AS
ZX
```

When you're in the Keypad Mode, hitting one of these keys turns on a dot to the left of the flashing < sign. Each key turns on a different dot. To see how this works, clear the screen (i.e. go to the Regular Mode and hit the 'Clear' key), then go to the Keypad Mode, and use the arrows to move the flashing < sign near the center of the screen.

Now hit the 'Q' key and notice which dot is turned on, then hit the 'A' key, then the 'Z' key, then 'W', 'S', and 'X'.

Now let's use the graphics keypad to erase dots. To do this, hold down the 'Shift' key and hit one of the letters in the graphics keypad. The dot in the position corresponding to the letter you hit will be erased.

Now move the flashing < sign to a new position on the screen, and use the keypad to turn on some combination of dots. Now, hold down the 'Shift' key and one or more arrows. The flashing < sign will move in the indicated direction and leave a trail of symbols just like the one you entered using the graphics keypad. This symbol will remain in memory until you hit one of the letters in the keypad again.

You might practice using the keypad for a while, entering various combinations of dots, and then drawing pictures using the 'Shift' and arrow keys. Note one tricky point: when you hit one of the keypad letters, the corresponding dot is combined with the dots already on the screen. The symbol that's stored in memory is the entire six dot postions to the left of the flashing < sign. For example, suppose the flashing < sign is "pointing to" a completely blank space, and suppose you hold down the 'Shift' key and hit the letter 'Q'. Then the symbol stored in memory is blank in all six dot positions, not just the position (upper left) corresponding to the letter 'Q'. Also note, however, that to store a symbol in memory -- so that you can use it to draw with -- you must hit at least one keypad letter. It does no good to merely point the flashing < sign at the symbol; nothing is stored in memory until you hit the first keypad letter.

This completes the list of commands available in the keypad Mode. Summarizing the additional commands:

KEYPAD MODE INTERMEDIATE COMMANDS

One of these:	QW AS ZX	.....Turn on corresponding dot to left of flashing < sign
'Shift' and one of	QW AS ZX	.....Erase corresponding dot to left of flashing < sign
'Shift' and Arrow(s)		.....Move in indicated direction and leave a trail of symbols like the one last entered with graphics keypad.

3.1 DESIGNATE MODE FILL IN OPTION

In Section 2.4 we saw how to mark off a rectangle and reverse the black and white areas inside. Now let's see how to fill in a rectangle with a specified graphics symbol.

1) Go to the Designate Mode by hitting the '-' key. Mark off a rectangle as before, that is, place '+' signs in diagonally opposite corners of the rectangle, move the flashing '-' inside, and hit the 'Enter' key.

2) When the five options appear, choose option 2, "Fill in", by hitting the '2' key.

3) The computer will ask you to enter the desired graphics symbol. How do you do that? With the graphics keypad. As an example, hit the 'Q' key, then the 'A' key, then the 'X' key. Note that the symbol is pictured between the > and < signs.

4) When you've got the symbol you want, hit the 'Enter' key. The computer will then fill in the marked off rectangle with the symbol you entered.

3.2 DESIGNATING A FIGURE

Now let's consider option 1, the "Designate" option. In page one, we claimed that we could magnify figures, rotate figures, shrink them, etc. How do we tell the computer which figure to use? We make a designated figure. Here are the steps in designating a figure.

1) Draw the figure if it's not already on the screen somewhere. (If you're trying this for the first time, make it a small figure.)
2) Go to the Designate Mode.
3) Use the arrows to move the flashing '-' onto the figure.
4) Use the 'Shift' key and the arrows to cover the entire figure with '+' signs.
5) Leave the flashing '-' sign on one of the '+' signs. Hit 'Enter'.
6) When the list of options appears, choose option 1 by hitting the '1' key. The computer will ask you if you want to see the figure's graphics codes. If you know what graphics codes are, and you want to see them, hit the 'Y' key. Otherwise hit any other key. (Note that you may use the graphics codes to manually construct a string.)
7) The picture will now reappear on the screen. The part of the screen that you covered with '+' signs is now the designated figure.

To move the designated figure go to the Regular Mode.

3.3 MOVING THE DESIGNATED FIGURE

REGULAR MODE - INTERMEDIATE COMMANDS FOR DESIGNATED FIGURE

'/' and Arrow(s).....Move figure in indicated direction.
'/' and 'Clear'.....Erase designated figure.
'/' and 'Spacebar'.....Load designated figure to screen.
'/' and 'Shift' and Arrow(s)..Draw, with designated figure as a "paintbrush".

EXAMPLES:

1) When you've gone to the Regular Mode (by hitting the period key), move the designated figure around the screen by holding down the '/' key and one or more arrows.

2) Now we'll make a duplicate of the designated figure. Record the screen to memory (by hitting the ';' and 'Enter' key). This will save the designated figure in its current position. Now move the designated figure to a new location. Load memory back to the screen (by hitting the ';' and spacebar). This will bring back the figure to the old location, but will erase the figure at the new location. Load the figure back at the new location by holding down the '/' key and hitting the spacebar. Now you've got two copies of the designated figure on the screen. You can make a third copy by recording the screen again, moving the figure to a new location, etc. You can erase a copy by using the '/' and 'Clear' keys.

3) To paint the screen, with the designated figure as a paintbrush, hold down the '/' and 'Shift' keys along with one or more arrows. Painting the screen in this way and then reversing black-white in various rectangles can give you some very interesting pictures.

Let's continue operating on the designated figure by going to the menu of options.

3.4 MENU OPTIONS 4 THROUGH 8

4) Let's magnify the designated figure. To do this, bring up the menu of options by hitting the '9' key, and then choose option 4 by hitting the '4' key. The computer will magnify the designated figure by a factor of 4. The magnified figure will not be centered on the screen, but you can center it by going to the Keypad Mode and using the '/' and the arrows.

5) Tilt the designated figure by going to the menu and choosing option 5.

6) Now go to the menu and choose option 6, "Four views of Figure". This option is useful for avoiding lopsided figures. You can draw just half the

intended figure, make this half the designated figure, and then let the computer draw the other half with option 6. Then move the designated figure over next to the view that represents the other half of the figure you want, and make a new designated figure out of the two halves.

7) Now go to the menu and try option 7, "Rotate Figure". You enter the rotation angle and then the computer asks you if you want the figure magnified. Hit the 'Y' key to get magnification and any other key for no magnification. The proportions of the magnified figure are usually more accurate than those of the non-magnified figure.

8) Now try option 8 of the menu, "Shrink/Pull -Apart Figure". You must enter a shrink/expand number for the X-direction and for Y-direction. Numbers less than one, .5 for example, shrink the figure. Numbers greater than one, 2 for example, expand it.

3.5 STORAGE OF DESIGNATED FIGURE

Before going to the remaining option (option 2), let's make a couple of observations about the way the designated figure is stored. First, since the designated figure is stored as a BASIC string, it can't be longer than 255 bytes. If you try to designate a figure that takes more than 255 bytes to store, the computer will use only the first 255 bytes of the figure. (The computer will give you a warning message about this, of course.) Second, the figure is stored using both graphics codes and control codes. This allows for efficient storage. To see what this means try the following:

1) Go to the Regular mode and put a dot in the upper left corner of the screen.

2) Move the flashing dot to the bottom row and leave another dot in the lower left corner of the screen, so that the bottom dot is lined up with the top dot. (The quickest way, incidentally, to get from the top row to the bottom row is to use the up arrow; the flashing dot will move off the top line and reappear on the bottom line.)

3) Now make a designated figure out of the two dots. It will, of course, take two '+' signs to cover the two dots. (Don't forget to leave the flashing '-' sign on one of the two '+' signs when you hit 'Enter'.)

4) Now go to the Regular Mode and draw a squiggle somewhere near the center of the screen.

5) Now move the designated figure to the right with the '/' key and the right arrow.

6) Here's the point of the demonstration. As the designated figure lines up with the squiggle in the middle of the screen, the squiggle will not be erased. The computer prints no blanks when it moves from printing the top dot of the designated figure to printing the bottom dot of the designated figure. The figure's control codes move the cursor without erasing.

(Incidentally, if you continue to move the designated figure until it touches the lower right corner of the screen then the screen will scroll upward. See "Location 1023" in the final section.)

3.6 MENU OPTION 2: STORE FIGURE IN BASIC STRING

Menu option 2 is used to store the designated figure so you can record it on tape, disk, or Stringy Floppy. Here's the procedure in the form of an EXAMPLE:

1) Hit the '9' key to bring up the menu, and choose option 2, "Store Figure in BASIC String", by hitting the '2' key.

2) The computer will ask you for a starting line number. Enter say, 10.

3) The computer will ask you for a name for the figure. Enter say, N$.

4) The computer will ask you for a name for the string that will erase the figure. Enter say, EN$.

5) Your picture will reappear on the screen. Now let's examine the stored figure. To do this, call the menu again, and choose option 3.

6) When the "Ready for Recording" message appears, the two strings are in memory as BASIC strings, the figure N$ on line 10, and the erasing string EN$ on line 20. (Sometimes a figure is too big to store on one line. If the figure uses close to 255 bytes, it takes two lines to store and the erasing string also takes two lines to store.)

7) If you tried to LIST lines 10 and 20, they looked rather strange. They are stored in compressed form which, unfortunately, doesn't list very well. (The non-compressed form of the designated figure can be seen when you first define the figure: hit 'Y' when the computer asks if you want to see the figure's graphics codes.)

8) Let's add some lines to lines 10 and 20 so we get a BASIC program that will print the figure N$ and then erase it. Don't worry about the fact that GEAP is still in memory. Type in the lines:

```
5 CLEAR 100
100 CLS: PRINT@ 30 , N$ ;
110 FOR I = 1 TO 2000 : NEXT
120 PRINT@ 30 , EN$ ;
```

Line 5 will clear string space for the strings in 10 and 20. Line 100 will clear the screen and then print the figure N$ at location 30. (Don't forget the semi-colon at the end of line 100.) Line 110 will cause a delay so you can examine the figure. Line 120 will erase the figure by printing the erasing string EN$ at location 30.

9) Now type in 'RUN' and hit 'ENTER'. The program will be executed. (Note: If you didn't clear enough string space in line 5, you'll get an OS error. If you get this error, change line 5 to clear more string space.) You can record this little program if you wish.

10) You can reactivate GEAP by typing in

```
CLEAR 1 : PRINT USR(4) : RUN
```

and then hitting 'ENTER'. (Note: The 'CLEAR 1' is necessary only when you've run a program that contains a CLEAR statement, as line 5 above does. Otherwise, you can just enter, PRINT USR(4) : RUN)

A final word of caution about storing a designated figure. Don't store a designated figure that contains a " (quote) mark. If you do, BASIC will give you an error message when it tries to read the string defining the figure.

3.7 INPUT STATEMENTS

Since we can't store quote marks, what do we use them for? We use them as a signal to insert INPUT statements. Suppose you go to the Print Mode, and type in :

```
ENTER YOUR NAME "
```

Now suppose you store the screen in PRINT statements with option 1 of the menu. Assuming you used non-compressed code, the screen text would be stored as:

```
10 CLS
20 PRINT "ENTER YOUR NAME";
30 INPUT A$
40 REM END DUMP
```

In the place where the quote mark occured, the computer inserted the line "INPUT A$". When you are storing the screen with option 1, the computer will insert an INPUT statement each time it comes to a quote mark. The variable following the INPUT statement will be whatever name you type in right after the quote mark; if you leave a blank after the quote mark, the variable will be A$. For example, if the screen says:

```
ENTER NAME "N$
ENTER ADDRESS "AD$
```

Then the stored program will be (in non-compressed form)

```
10 CLS
20 PRINT"ENTER NAME ";
30 INPUT N$
40 PRINT"ENTER ADDRESS";
50 INPUT AD$
60 REM END DUMP
```

(NOTE: Since executing an INPUT statement causes a jump to the beginning of the next line (after you hit 'ENTER'), you should use only one quote mark per line. Extra quote marks on the same line will be ignored.)

3.8 LOADING PICTURES FOR RE-EDITING

You may want to do more work on a previously saved picture. Or, you might have some BASIC program that creates a picture that you would like to edit using GEAP. You can load a picture into GEAP as follows:

1) Load and RUN GEAP.

2) When the flashing dot appears, call up the menu and choose option 3 by hitting the '3' key.

3) When the "Ready for Recording" message appears, load the picture creating program (i.e. CLOAD from cassette, LOAD from disk or &LOAD from Stringy Floppy).

4) Add the following line after the statements that print the picture. (Say, the last print statement was on line 90.)

```
91 CLEAR 1 : PRINT USR(1) : PRINT USR(4) : RUN
```

5) Now enter 'RUN'. The print statements will put the picture on the screen and then line 91 will be executed. Line 91 will cause the screen to be stored in GEAP 's memory and will activate GEAP.

6) When GEAP's flashing dot appears, hold down the 'Shift' key and then hit the spacebar. You picture will appear, ready for editing.

NOTE: You cannot load a BASIC picture drawing program into GEAP if the picture drawing program uses the USR () command.

4.0 ADVANCED COMMANDS AND FINE POINTS - MARKING OFF THE SCREEN

We've seen that we can mark off a rectangle and fill it in, or reverse black-white within it. We've also seen how to designate a figure by covering it with '+' signs. These options can be swapped. That is, we can mark off a rectangle in the usual way, and then make the rectangle the designated figure by choosing option 1, the "Designate" option. (The rectangle must be a small one, of course, since a designated figure can use at most 255 bytes.) We can also cover part of the screen with '+' signs, leave the flashing indicator on a '+' sign, hit 'Enter', and then choose option 2, "Fill in", or option 3, "Reverse".

There is a third method of marking off part of the screen. We can cover the boundary of a figure with '+' signs, move the flashing '-' sign inside the boundary, and hit 'Enter'. The boundary does not have to be rectangular. It does not even have to consist of a single piece. For example, suppose we use the 'Shift' and arrows to draw a very large square of '+' signs. Now suppose we move the flashing '-' sign inside the large square, and use the 'Shift' and arrow keys to draw a small square of '+' signs inside the large square. Now we move the flashing '-' sign so that it's outside the small square, but still inside the large square. Now we hit 'Enter' and choose option 3, the "Reverse" option. The figure within which black-white is reversed consists of the large square with a "hole" punched out where we drew the small square. The part of the picture inside the small square is left alone.

Or we might outline a giant 'L' shape with '+' signs, move the flashing '-' sign inside the 'L', hit 'Enter', and choose option 2 to fill in the 'L' with a graphics symbol.

There is, however, one restriction on an outline. The outline must consist of horizontal and vertical segments; no diagonal segments are allowed. Note, though, that diagonal segments can be approximated by a "staircase" of

horizontal and vertical segments (i.e. "over", then down, then over, then down, etc).

The best way to learn this third method of marking off the screen is to experiment. Draw outlines of many different shapes and see which ones the computer will fill in.

4.1 MERGING PICTURES

Now let's deal with the remaining option for the Designate Mode, the "Merge" option. To merge two pictures proceed as follows:

1) Draw (or load as in section 3.8) the first picture and record it to long term storage by going to the Regular Mode and hitting the ';' and ENTER keys.

2) Get the second picture on the screen. You can draw it or load it; you can use any of GEAP'S commands (except, of course, save screen to memory -- you don't want to erase the first picture).

3) When the second picture is drawn, save the screen to temporary storage. To do this, simply call up the menu of options, which will automatically save the screen, and then choose option 9, the cancel option.

4) Check the positioning of the two pictures. To do this, go to the Regular Mode and hit the ';' and the spacebar. This will restore the first picture so you can look at it. Bring back the second picture by holding down the SHIFT key and hitting the spacebar.

5) If the second picture is not positioned correctly, move it by going to the Keypad Mode and using the '/' and arrow keys. When you think it's ready, check again as in steps 3 and 4.

6) When the second picture is positioned correctly, go to the Designate Mode, and mark off the area of the second picture that you want to insert into the first picture. Mark off the area as if you were going to fill it in, except:

7) when you hit ENTER and get the options, choose option 4, the "Merge" option.

8) The computer will combine the part of the first picture that is outside the marked off area with the part of the second picture that is inside the marked off area.

9) The first picture will remain in long term storage. The merged picture will be on the screen and also in temporary storage.

4.2 16K MEMORY AND STORAGE OVERFLOW

If you are using 16K memory, and have stored several pictures in PRINT statements, you may get the message "Recording . . . Using Reserve Storage" when you save the screen to memory with the 'Enter' key. This means that there's not enough room to save the screen in the usual buffer. The screen is saved instead to a temporary buffer. The temporary buffer is used by other commands (moving the entire screen for example). If you use one of these other commands, it will erase your stored picture.

Also, if you save too many pictures and figures, the storage area will overflow. In most cases, the computer will print "Storage Overflow ... Dump Storage". You can salvage most of the storage as follows. Enter 'PRINT USR (4)'. Now CSAVE the storage area (or @SAVE with Stringy Floppy). The last picture will be cut off at the point where it overflowed, but all previous pictures and figures will be intact. You can then reactivate GEAP as usual by entering 'PRINT USR(4) : RUN'.

4.3 DELAY LOOPS

You may want to write a program that will print only part of a picture and then delay for a number of counts before printing the rest. To do this using GEAP, draw the complete picture, then go to the line where you want the delay to

start. Put a "(quote) mark in the last column (column 63) of the line. Then store the picture with option 1 of the menu. Where the quote mark occured, GEAP will insert an INPUT A$ line. Assume the line number was 50. Then replace line 50 with the line:

```
50 PRINT : FOR I=1 TO 999 : NEXT
```

When you RUN the program, line 50 will cause a delay of 999 counts before printing the rest of the picture.

4.4 LOCATION 1023 AND THE SCREEN EDGES

If you print a symbol, using a BASIC PRINT@ statement, in the last column of a line, then BASIC automatically sends the cursor to the beginning of the next line. Also, if you PRINT a symbol in the lower right corner of the screen (location 1023), then BASIC will make the screen scroll upward. These two facts limit the places where the designated figure can be printed. If part of the designated figure touches the edge of the screen, the figure will break up. If part of the figure touches the lower right corner, the screen will suddenly start rolling upward. If one of these effects happens, move the figure back toward the center of the screen.

We've also rigged GEAP so the flashing cursors cannot wander into location 1023. This may cause a problem, for example, if you want to "reverse" the whole screen. How do you mark off a rectangle consisting of the whole screen? You put '+' signs in the upper right and lower left corners. That will do the trick.

4.5 MENU OPTIONS 1 AND 2 COMPARED

With option 1 you always save the entire screen. With option 2, you can save at most 255 bytes of the screen. Since the designated figure usually includes control codes, which take storage space, you usually are limited to less than 255 bytes of the screen.

No preliminary operations are required to use option 1. Option 2, on the other hand, requires you to designate a figure beforehand.

To see a picture stored by option 1, you just enter 'RUN'. To see a figure stored by option 2, you must add you own PRINT @ commands.

The picture stored by option 1 always appears in the same location; you can't move it across the screen. The figure stored by option 2, on the other hand, can be moved around on the screen by using the PRINT @ command with different locations following the @ sign.

A program created by option 1 ends with a line that says: REM END DUMP

A program created by option 2 consists of a string defining the designated figure and a string defining the erasing figure. There is no special message at the end.

4.6 CREATING YOUR OWN GEAP EXPANSION MODULES

Perhaps GEAP does not have the command you are looking for. Perhaps you've thought of a command you'd like to add to GEAP. Well, GEAP allows for expansion. You can add your own customized modules to GEAP.

A GEAP expansion module has a three part format. The first part is .the "string reset". The string reset consists of three lines:

```
1962 PRINT USR(4) : CLEAR 1
1965 X%=800 : PRINT USR(21)
1970 CLEAR 200 : GOSUB 1952
```

These three lines are always the same except for the amount of string space cleared in line 1970, and the value of the variable X% in line 1965. The variable X% in line 1965 is set equal to the amount of storage space you think you need for all variables. It should be at least 600 more than the amount of string space you decide to clear in line 1970. Note that GEAP by itself needs

about 100 bytes of string space, and about 700 bytes of space for all variables.

After the string reset comes the "initialization" section. In this section you initialize the variables you want to use. (We'll give an example below.) The only requirements for this section are that no line number is higher than 4999, and that the last command in the section is GOTO 61.

The final section is the "action" section. This section always begins with line number 5000, and it always ends with line number 10001. The section consists of a subroutine. The subroutine is called from GEAP's Designate Mode. When an expansion module is present, and GEAP is in the Designate Mode, GEAP will scan the keyboard looking for the usual commands; if none of the usual commands are received, GEAP will execute a GOSUB 5000, and run through whatever subroutine you've inserted.

We'll give an example and show how to adjoin expansion modules to GEAP in a minute. First, however, we'll list some information about variables and subroutines that GEAP uses:

1) Variables beginning with A-H are string variables. GEAP does not use any variable beginning with the letter C.

2) The designated figure is variable F. The string that erases F is Variable E.

3) Variables beginning with I-Y are integer variables. GEAP does not use any variable whose second symbol is a number higher than 3. GEAP does not use the variable K4, for example.

4) The variable A is a temporary storage variable. The variable I is a loop counter.

5) The subroutine USR(1) stores the screen in a temporary buffer. The subroutine USR(0) loads the temporary buffer back to the screen.

Here's an example of an expansion module. This module stores designated figures in a string array. The current designated figure is stored by going to the Designate Mode and hitting the 'T' key. The computer stores the figure and prints out its array number. The figure can then be printed on the screen by going to the Designate Mode, moving the flashing cursor to the desired spot, and hitting the figure's array number. Up to 8 different figures may be stored in the array.

```
1962 PRINT USR(4) : CLEAR 1
1965 X$= 1600 : PRINT USR(21)
1970 CLEAR 1000 : GOSUB 1952
1980 DIM C(8) : K4=1 :CLS
1990 GOTO 61
5000 A=INKEY$
5010 IF VAL ( A ) ) 0 THEN PRINT C( VAL(A) );
5020  IF A="T" THEN C(K4)=F : I=USR(1) : CLS :
     PRINT "STORING FIGURE NUMBER"; K4 : FOR I=1 TO 999 :
     NEXT : I = USR(0) : K4 = K4 +1 : IF K4)8 THEN K4 = 1
10001 RETURN
```

Lines 1962-1970 are the string reset lines. We clear 1000 bytes of string space for the array C ( ). This might not be enough if we try to store 8 large figures. Lines 1980-1990 are the initialization section. We dimension the array C, and set the index variable K4 equal to 1. Line 1990 transfers back to the main GEAP program. Lines 5000-10001 are the action section. Line 5000 is called from the Designate Mode; the line records which key was hit. Line 5010 checks to see if a number key was hit, and if one was, prints the string corresponding to that number. Line 5020 checks to see if the 'T' key was hit. If it was, then the current designated figure F is stored in the array, the screen is saved, the message is printed, the screen is restored, and the array index is updated. Line 10001 returns to the Designate Mode.

We adjoin expansion modules, such as the one above, to GEAP as follows:

1) Load and RUN GEAP
2) When the flashing dot appears, call up the menu and choose option 3.
3) When the "Ready for Recording" message appears, enter 'NEW'.
4) Type in the expansion module. (Or, if it's already stored on tape, disk, or Stringy Floppy, load it in.)
5) Enter 'RUN'.

When the flashing dot reappears, GEAP is ready with its usual commands plus those added by the expansion module. The module will remain adjoined to GEAP as long as GEAP itself is in memory. You can, for example, store a picture, record it, and reactivate GEAP as usual.

You can create a standard library of figures with an expansion module. You can store large letters, your firm's logo, often-used sentences, etc.

EXAMPLE: Suppose you want to have the sentence "Your check is in the mail.", always available so G E A P will print it with a single keystroke. Proceed as follows:

1) Load and RUN GEAP.
2) Write the sentence, "Your check is in the mail." on the screen and make it the designated figure.
3) Call up the menu and store the sentence in a BASIC string with option 2. For the line number choose 1980, and for the name of the string choose C.
4) Call up the menu and choose option 3.
5) When the "Ready for Recording" message appears, your sentence will be in memory on line 1980, and the erasing string on line 1990.
You aren't going to need the erasing string, so delete line 1990.
6) Type in the lines:

```
1962 PRINT USR(4):CLEAR 1
1965 X$=750 : PRINT USR(21)
1970 CLEAR 150 : GOSUB 1952
(1980 C="YOUR CHECK IS IN THE MAIL"  ) already in memory.
1990  CLS : GOTO 61
5000 A=INKEY$
5010 IF A = "M" THEN PRINT C;
10001 RETURN
```

7) You may want to record the expansion module at this point so you won't have to retype it if you should want to use it in the future.
8) Enter 'RUN'.

When the flashing dot appears, you may print your sentence whenever you want to by going to the Designate Mode, moving the flashing '-' sign to the desired spot, and hitting the 'M' key.

Of course, instead of storing just one sentence, you could store several sentences or figures, and make each one correspond to a different keyboard letter.

APPENDIX - Merging Two BASIC Programs

The picture drawing programs that are created by GEAP can be combined with a program of your own, and the pictures can be called as subroutines. Each picture ends with a line that says 'REM END DUMP' . Replace each of these lines with a line saying 'RETURN'. Then, at the points in your program where you want a picture printed, simply insert the command GOSUB X, where X is the picture's initial line number.

16K PROCEDURE FOR MERGING PROGRAMS

1) Check that the line numbers in the second program are higher than those in the first program.

2) Load the first program.

3) Enter 'POKE 16548, PEEK (16633)-2 : POKE 16549, PEEK (16634)'. If you don't get an FC error, go to step 4. If you do get an FC error, enter: POKE 16548, PEEK (16633)+254 : POKE 16549, PEEK (16634)-1 and go to step 4.

4) Load the second program.

5) (For the Model I,) Enter 'POKE 16548, 233 : POKE 16549, 66'
(For the Model III,) Enter 'Poke 16548, 233 : POKE 16549, 67'
Your two programs have now been combined into one.

PROCEDURE FOR DISK BASIC USERS

If you used the compressed format selection, you may not be able to use the MERGE command if trying to combine two BASIC programs created in different sessions. The reason is that the MERGE option requires that you save the program to be merged in ASCII format. Programs that used the compressed form or strings created with GEAP may not be saved as ASCII files.

If you are using Disk Basic, you can combine two programs with the help of GEAP. Proceed as follows:

1) Check that the line numbers in the second program are higher than those in the first program. Also, check that the first line number of the first program is greater than 1, and that the last line number of the first program is less than 10001.
2) LOAD and RUN GEAP. When the flashing dot appears, hit the 'BREAK' key.
3) LOAD the first program.
4) Enter PRINT PEEK (16548), PEEK(16549) . Copy the two numbers that are printed. (These numbers will vary depending on the number of files open, whether you are using BASIC or BASICR, etc., but should remain constant for a given configuration you use all of the time.)
5) Type in the following two lines:

```
1     GOTO 10001
10001 PRINT USR(21) : PRINT USR(2) : PRINT USR(4)
```

6) Enter 'RUN'
7) When the 'READY' appears, LOAD the second program.
8) Take the numbers from step 4 and POKE them back into their original positions. The statement would be :

```
POKE 16548,XXXX : POKE 16549,YYYY
```

where XXXX would be the first number from step 4 and YYYY would be the second number from step 4.
9) Delete lines 1 and 10001. To do this type in '1' and hit 'ENTER', then type in '10001' and hit 'ENTER'.
Your two programs have now been combined into one.

WARRANTY AND LICENCING AGREEMENT

J.F. CONSULTING has made a reasonable effort to provide you with good quality software and documentation. However, this software and documentation is distributed on an "as is basis."

NO OTHER WARRANTY IMPLIED OR EXPRESSED EXISTS

However, if you should have a problem, we do desire to know what it is.
Please feel free to write us with any of your comments or suggestions.

Graphics Editor and Programmer Instruction Manual (GEAP)

SUMMARY OF COMMANDS

Note: "Cursor" means the flashing mode indicator

Regular Mode (cursor = flashing dot)

Arrow(s)	Move cursor in indicated direction.
'Shift' and Arrow(s)	Draw line in indicated direction
'/' and Arrow(s)	Move designated figure in indicated direction.
'/' and 'Shift' and Arrow(s)	Draw, with designated figure as a "paintbrush".
';' and 'Enter'	Save screen to memory.
';' and 'Spacebar'	Load memory back to screen.
'Shift' and 'Spacebar'	Load temporary buffer to screen
'/' and 'Spacebar'	Load designated figure to screen.
'Clear'	Clear the screen.
'/' and 'Clear'	Erase the designated figure.
'9'	Call up menu of options.
'<'	Go to Keypad Mode.
'-'	Go to Designate Mode.
'*'	Go to Print Mode.

Print Mode (cursor = flashing asterisk)

Arrow	Move one space in indicated direction
Enter	Go to center of current line
@ and Arrow(s)	Move in indicated direction to corner or edge of screen.
@ and 'Enter'	Move to center of screen
'Clear'	Go to Keypad Mode
'Shift' and Arrow	Print picture of arrow.
'"' (quote)	Insert INPUT statement. Variable name follows quote. (If blank follows quote, default to A$).
Any other symbol	Print symbol hit and move to right.

Keypad Mode (cursor = flashing less-than sign)

Graphics Keypad	QW AS ZX	The keypad is defined as the six letters on the left side of the keyboard.
		Pressing any letter on the graphics keypad will turn on the corresponding dot at the left of the cursor. Pressing 'Shift' and letter of graphics keypad will erase the corresponding dot at left of cursor.
Arrow(s)		Move cursor in indicated direction.
'Shift' and Arrow(s)		Draw line of symbols like the one last entered with graphics keypad.
'/' and Arrow		Move entire screen in indicated direction.
'Enter'		Print cursor's current coordinates.
'Spacebar'		Draw horizontal line through cursor.
'9'		Call up menu.
'*'		Go to Print Mode.
'-'		Go to Designate Mode.
'.' (period)		Go to Regular Mode.

Designate Mode (cursor = flashing minus sign)

Arrow(s)	Move cursor in indicated direction.
'Shift' and Arrow(s)	Mark location with a '+' sign and move in indicated direction.
'Enter'	Record part of screen marked with '+' signs, and bring up designate, fill in, reverse, merge, and cancel options.
'Clear'	Erase '+' signs and start again to mark off screen.
'9'	Call up usual menu of options.
'<'	Go to Keypad Mode.
'*'	Go to Print Mode.
'.' (period)	Go to Regular Mode.
Other symbols	Go to expansion module if one is adjoined.

Menu (called with '9' key)

1) Store screen in PRINT statements. Picture stored is the one on the screen when the '9' key was hit.

2) Store figure in BASIC string. The designated figure is stored as a BASIC string. String that erases figure is also stored.

3) Dump storage. Prepare storage for recording. Also used to load pictures into GEAP, and to prepare for adjoining expansion modules.

4) Magnify figure. The designated figure is magnified by a factor of four (4X).

5) Tilt figure. The designated figure is tilted.

6) Four views of figure. Four symmetrical views of designated figure are drawn.

7) Rotate figure. The designated figure is rotated through an angle entered by operator. Has magnification option.

8) Shrink/Pull-Apart figure. The designated figure is pulled apart or shrunk. Two numbers are entered, one for the X-direction, one for the Y-direction. Numbers less than one shrink figure, numbers greater than one pull it apart.

9) Cancel. Return to picture.

NOTE: Menu options 2, and 4 - 8 will not operate until a figure has been designated. See Section 3.2
After saving stored pictures, it is not necessary to reload GEAP. See section 2.1, step 12.

ERROR MESSAGES

Message	Section of Manual
RECORDING . . . USING RESERVE STORAGE	4.2
TAKING 255 BYTES OF FIGURE	3.5
NEED MORE DATA	3.2
STORAGE OVERFLOW	4.2

TABLE OF CONTENTS
GEAP 48K DISK VERSION

Introduction (5.0) 1

Save or Load Screen Image (Cmd. 'FG') (5.2) 1

Load Data File to Screen (5.3) 1

Call Up Primary Menu Selections (Cmd. 'IO') (5.4) 2

GEAP Expansion Modules - Important Notes (6.0) 2

Overview of Expansion Module Design 2

Expansion Module Loading (6.1) 3

Expansion Module 1 (7.0) 3

Exchange Long Term and Temporary Storage Areas (Cmd 'X') (7.1) 4

Automatic Designation of Figure (Cmd 'S') (7.2) 4

Magnify - Rotate - Shrink (Cmd. 'M') (7.3) 4

Expansion Modules 2, 3, 4 - General Instructions (9.0) 6

Medium Letter Set - Expansion Module 2 (9.1) 6

Large Letter Set - Expansion Module 3 (9.2) 6

Cube Letters - Expansion Module 4 (9.3) 6

Further Expansion Modules (9.4) 7

Epson Printer - Introduction (10.0) 7

Epson Printer Support Instructions 7

Newscript Module Instruction (11.0) 8

Using Newscript Module (11.1) 8

Switching Between Newscript and GEAP (11.2) 9

Notes on Using Newscript with GEAP 9

GEAP's Screen Format vs Newscript Screen Format 10

5.0 GEAP DISK VERSION 48K - INTRODUCTION

THE GEAP 48K DISK version contains all of the features of the regular GEAP version plus additional disk related commands. With this version GEAP Expansion Modules are included and menu commands are incorporated to allow you to automatically load these modules. We will assume that you have a good understanding of the regular GEAP commands when reading the following documentation.

5.1 SAVE or LOAD SCREEN IMAGE - (Command 'FG')

When in the designate mode, press the "F" and "G" keys at the same time. The following will appear:
1=SAVE SCREEN TO DATA FILE, 2=LOAD DATA FILE TO SCREEN, 3=CANCEL
These new commands are designed to allow you to save what is on the screen to a disk file, and then rapidly recall the image when you wish to work with it again.

5.2 SAVE SCREEN TO DATA FILE

If you choose selection number 1, "SAVE SCREEN TO DATA FILE", the next thing that will happen is that a line of numbers will decend on the left side of the screen. You will then be asked to "ENTER THE NUMBER OF LINES TO BE SAVED". Choose a number between 1 and 16 and then press <ENTER>. The next question that will be asked is "ENTER FILE NAME". This can be any standard TRSDOS file name. An example filename would be: DRAWING1
Please refer to your TRSDOS manual if you need to know more details on file names. If you are a beginner, simply remember to use a name that is 8 letters or shorter.

After you have typed in a filename, press enter. "SAVING FILE" will appear and you will then be returned to the designate mode.

5.3 LOAD DATA FILE TO SCREEN

With this command, a previously saved file using the SAVE DATA FILE option above can be loaded to the screen. If you have a drawing on the screen that you do not want to lose, either save it first in the permanent storage area (see regular mode command ';' and <ENTER>), or save it to a disk file as described above.

When in the designate mode, press the "F" and "G" keys at the same time. Choose option 2. You will be asked to "ENTER FILE NAME TO BE LOADED". Type in the name of the file you wish to load and press <ENTER>. The screen will then be filled with the contents of the file and you will be returned to the designate mode.

5.4 CALL UP PRIMARY MENU SELECTIONS - (Command 'IO')

When in the designate mode, press the "I" and "O" keys at the same time. A menu with 9 options will appear. Before you start making selections, read the instructions for each selection so you don't get yourself in trouble. For right now, just remember command number 8, "RETURN TO BASIC". Remember that GEAP resets some of the internal parameters in memory when it is run. If you just press the BREAK key and then try to run another basic program or run GEAP without going to DOS READY, you may not like the results. When you exit from GEAP using selection 8, we return everything to normal so you don't have to reboot your system before running other programs.

Before going further, read "GEAP OPTIONAL EXPANSION MODULES, INTRODUCTION AND IMPORTANT NOTES".

6.0 GEAP OPTIONAL EXPANSION MODULES INTRODUCTION AND IMPORTANT NOTES

Before attempting to use GEAP Expansion Modules, we strongly suggest that you familiarize yourself with the regular GEAP commands. We are assuming that you have a good basic understanding of the regular GEAP commands when reading the following instructions.

The following information is important for you to read so you will be aware of what you can and cannot do with GEAP expansion modules. You will find that we have planned for much future flexibility. We have, however, a few rules that must be followed.

OVERVIEW OF EXPANSION MODULE DESIGN

GEAP Expansion Modules are designed to be loaded as needed. We use the expansion module idea so that we can add an unlimited number of commands to GEAP without worry of running out of memory. The expansion modules all load into the same place, and therefore, only one module can be in place at a time.

To conserve memory, several "common," shared memory areas are used in GEAP. One example of a common area is the area where the Basic program that GEAP has written is stored. When you use option 1,"STORE SCREEN ON PRINT STATEMENTS", the area where your program is stored is in a common area. When loading a picture for re-editing, the program you are loading uses this common area. If you load a program when the "READY FOR RECORDING" message is present, the program loads into a common area. Using program option 2 STORE SCREEN IN BASIC STRINGS, also uses the common area.

An example of how you can get into trouble would be the following: (When following this example, be sure that you are not working with any drawing that is of value to you.) When in the 'Regular' mode, press '9' and call up the menu of options. Select GEAP option 1,

STORE SCREEN ON PRINT STATEMENTS. When finished, choose option 3, DUMP STORAGE. When 'READY FOR RECORDING' appears, type LIST. You will see the program that GEAP wrote. Now if you load another program for re-editing, and then type LIST, you will notice that the first program is gone forever. This is because the "common area" is used.

Getting back to the expansion module, caution must be used since, when an expansion module is loaded, it ocupies the common area until it is in place. If you use GEAP to write a BASIC program for you, be sure to save it onto disk or cassette before changing expansion modules. After the expansion module is in place, this common area is then available for programs written by GEAP.

Remember that until your drawing is on disk, or cassette, it is not safe. The all-mighty, indiscriminate power outage, or surge can strike at any time, so it is a good idea to periodically save your creations. Have fun with your GEAP EXPANSION MODULES, but remember the following:

1. Save programs which GEAP has created before loading new expansion modules.
2. Periodically save your drawings to tape or disk.

6.1 EXPANSION MODULE LOADING

All of GEAP's Expansion Modules load in the same manner. To load an expansion module do the following:

1) Load and RUN GEAP as usual.
2) When the flashing dot appears go to the designate mode and then press "I" and "O" at the same time.
3) Select the EXPANSION MODULE you wish to run by selecting the appropriate number.
4) After the module has loaded follow the instructions for the module you have just loaded.

7.0 EXPANSION MODULE 1

When Expansion Module 1 is in place, three new commands are available in the designate mode. Be sure to "play" with them before doing any serious work. When improperly used, they can destroy a drawing.

EXPANSION MODULE 1 - DESIGNATE MODE COMMANDS

'X'.....Exchange long term and temporary storage contents.
'S'.....New designate, reverse, fill in and merge options.
'M'....."Macro" magnification and rotation routine.

7.1 EXCHANGE LONG TERM AND TEMPORARY STORAGE AREAS (COMMAND 'X')

When you hit the 'X' key the contents of the long term and temporary storage areas are exchanged. This command is handy when you want to merge two drawings and have to reposition both of them before you merge them. First, you reposition the drawing which is in the temporary buffer (by going to the keypad mode and using the '/' key and the arrows). Then you exchange the buffers and reposition the drawing which has moved into the temporary buffer. Then you merge them as usual.

A note of caution. It's easy to forget that a drawing on the screen is not necessarily stored in the temporary buffer. Be sure you actually have drawings in both buffers before using the 'X' command.

7.2 AUTOMATIC DESIGNATION OF FIGURE (COMMAND 'S')

The purpose of this command is to save you the trouble of marking the screen with '+' signs. When you press the 'S' key, the computer "marks off" all non-blank characters on the screen and brings up the designate, fill in, reverse, merge and cancel menu.

This allows you to quickly designate a figure. Just draw the figure on an otherwise blank screen. The go to the designate mode and press 'S.' You will see a line moving across the top of the screen as the computer "marks off" your figure. When the menu appears, choose option 1 and you're done. Of course, the figure still has to be small enough to take up less than 256 bytes of storage space.

The 'S' command is also handy if you want to merge every non-blank character on the screen with the drawing stored in the long term buffer. Just press 'S' and then choose menu option 4, as usual.

The "Reverse and Fill In" options are a little tricky. At first you might think that the reverse option would always give you a blank screen. If only the non-blank characters are reversed, why isn't the entire picture made blank? Well, there is a difference between a non-blank graphics character and a non-blank graphics dot. Each non-blank graphics character has from 1 to 6 lit dots or pixels. (You see this when you use the graphics keypad to construct a graphics character.) When you press the 'S' key and choose the Reverse option, two things happen: (1) All characters which were blank in all six of their pixels are still blank: but (2) All characters which had at least one lit pixel are reversed, the blank pixels are lit and the lit pixels are blanked. (Letters and other non-graphics symbols are left alone.)

You will probably have to experiment for awhile before you will be able to predict the outcome of a "Reverse" or "Fill In" command preceded by the 'S' command. If you are in doubt, it's best to

mark off the screen yourself with '+' signs rather than use the 'S' command.

7.3 MAGNIFY/ROTATE/SHRINK (COMMAND 'M')

This command works with graphics characters only. Numbers, letters and other non-graphics symbols will be erased.

This command allows you to rotate the picture on the screen by an angle between 0 and 360 degrees. At the same time you may magnify the picture by a factor of 1 to 9. There is also a shrink option.

The picture does not have to be within the 255 byte limit on designated figures; it may be quite large. There is, however, a limit on the complexity of the picture so be sure to save any important pictures in case you don't like the results.

When you press the 'M' key you will see a line descending on the left as the screen contents are recorded. If the line stops before it reaches the bottom of the screen, then the buffer is full and the remainder of the screen will not be recorded. There is, then, a slight pause while the center of the drawing is calculated.

Next the menu will appear: 1=SHRINK 2=ROTATE/MAGNIFY 3=CANCEL

If you choose option 2, you will first be asked for an angle of rotation. The important angles are:

0 degrees.....Straight up and down, no rotation.
90 degrees.....Picture sideways, to the right.
180 degrees....Picture will be upside down.
270 degrees....Picture sideways, pointing left.

Other angles can be used, but the accuracy of the results depend on the figure and the amount of magnification. (Distortion may occur due to the fact that the TRS-80 graphics pixels are about 2.3 times as high as they are long: it's impossible to slice a pixel in half.)

After you enter the rotation angle, you are asked for the magnifying factor, between 1 and 9. A factor of 1 results in no magnification.

After the figure has been drawn you will be asked if you want to redraw the figure. Hit 'Y' for yes and 'N' for no.

If you try a magnifying factor so large that the figure won't fit on the screen, the computer will only draw the part of the figure that will fit on the screen. When it comes to a part that won't fit, it will flash a '+' sign in the upper right corner.

9.0 LETTER SETS - EXPANSION MODULES 2, 3, AND 4 GENERAL INSTRUCTIONS

When an expansion module letter set is in place, the cursor controls are the same as in the print mode. The spacebar will space and erase according to the size of the current letters. The limits of the screen are also redefined according to the size of the letter so you won't try to print a figure off of the screen.

9.1 EXPANSION MODULE 2 - MEDIUM LETTER SET

When in the designate mode call up the menu by pressing "I" and "O". Select number 2 "MEDIUM LETTERS". The module will then be loaded.

A flashing "M" will now appear as your cursor. Now when you type a letter, say "A", a large "A" will appear on the screen. To exit this mode, press the <CLEAR> key. To re-enter this mode without reloading this module, press the "M" key.

9.2 EXPANSION MODULE 3 - LARGE LETTER SET

When in the designate mode press the "I" and "O" keys at the same time. A menu will appear. Select number 3 "LARGE LETTERS". The module will then be loaded.

The cursor will be replaced by the flashing "L". To exit this mode, press the <CLEAR> key. To re-enter this mode without reloading the expansion module, press the "L" key.

'Shift' and Arrow prints a picture of the arrow, with one possible exception. In Model III's and some Model I's, to get down arrow, press 'Shift', 'down arrow' and 'Z' keys.

9.3 EXPANSION MODULE 4 CUBE LETTERS

When in the designate mode, press the "I" and "O" keys at the same time. Now select menu item 4, "CUBE LETTERS". The module will then load.

The cursor will be replaced with a flashing 'C' when in this mode.

There are some additional commands which allow four different variations of the cubes. There is also a variation which allows just the face of the cube to be printed without the extensions. The commands for getting the different variants are as follows:

The following works like an on/off switch. Once you give the command to turn on a background, it will remain on, until you select another background.

<SHIFT> + 'Q' Cube background at upper left.
<SHIFT> + 'W' Cube background at upper right.
<SHIFT> + 'A' Cube background at lower left.
<SHIFT> + 'S' Cube background at lower right.
<SHIFT> + 'N' No background is printed.

To exit this mode, press the <CLEAR> key. To re-enter this mode without reloading the module, press the "C" key.

Note that the '&' sign is defined as a "blank". No, we're not trying to short change you. This letter is not commonly used (in our opinion), so we made a cube for you to use to draw any symbol which we left out or is not a standard keyboard symbol.

9.4 FURTHER EXPANSION MODULES

We have included a menu into which future expansion modules can be inserted. Go to the Designate mode and hold down the "U" and "D" keys together. The menu will appear.

Option 1 of the menu, "Operator enters filename of module to be loaded", is for loading modules you have created yourself. (See section 4.6 for directions on creating your own expansion modules.) If you choose option 1, you can enter the filename you have chosen for your module and the module will be loaded.

Options 2-8 will load modules which we plan to offer in the future.

10.0 EPSON PRINTER SUPPORT MODULE - INTRODUCTION

The Epson printer support module is designed to allow you to use the features that the Epson MX-80 has in combination with GEAP. You can have emphasized, double strike, or select the various print size densities that Epson offers. (Epson MX-80 is a trademark of Epson America, Inc.)

The program utilizes a fast machine language routine to translate the graphic codes into printable characters. When using this module, the Epson should be set to the MX-80 MODE, not the TRS-80 MODE.

10.1 INSTRUCTIONS FOR EPSON PRINTER SUPPORT MODULE

When in the designate mode press the "I" and "O" keys at the same time. Select menu item 5, "EPSON MX 80 PRINT MODULE". After the module has loaded, when in the designate mode (flashing minus sign), press the "P" key.

You will then be asked if you want to CHANGE CURRENT PRINTER MODE. If you answer no, the printer will remain in the mode that it was last in or if you have just powered up, it will be in its power up

state. (The exception to this is the 40 character per line option, this must be specified the first time the module has been loaded.)

If you select CHANGE CURRENT PRINTER MODE, you will then be asked to select how many characters per line you wish. Select a number. (Note that if you choose the 40 characters per line, only the first 40 characters starting from the left side of the screen will be printed.)

Next you will be given options for emphasized and double strike print. If you choose the 16.5 characters per line mode, the emphasized mode will not be offered since it is not allowed with the MX-80.

The next question will be how many lines of the screen you wish to print, starting from the top. This option allows you to create a continuous printout without unneccesary lines using several screen images.

Finally you will be asked to ready your printer. After you have positioned the paper, press <Enter>. When finished you will be returned to the designate mode.

11.0 NEWSCRIPT MODULE INSTRUCTIONS

The Newscript expansion module is automatically included with the GEAP 48K disk version. To use this module, you should have the Newscript 6.2 or better update available from Prosoft. (Copyright Micro-Systems Software, Inc.)

The Newscript module will create a file that is ready for printing with Newscript. The "format off" command command will be inserted at the beginning of the file and the "format on" command will be inserted at the end of the file. In addition, the "translate" command for the MX-80 may be optionally added to the beginning of the file. (This allows printing of standard TRS-80 graphics within Newscript.)

Commands are included to load back onto the screen a file created as described above. When this function is used, the "dot" commands inserted automatically will be ignored when loading the file from disk.

11.1 INSTRUCTIONS FOR USING THE NEWSCRIPT MODULE

First load the module by pressing "I" and "O" when in the designate mode. Select menu item 6, "LOAD/SAVE NEWSCRIPT COMPATIBLE FILE". After the module has loaded the following will appear:

1=SAVE SCREEN TO DISK FILE 2=LOAD DISK FILE TO SCREEN, 3=CANCEL

SELECTION NUMBER 1, SAVE SCREEN TO DISK FILE

When this option is chosen, the first thing that will happen is that a row of numbers will appear on the left side of the screen. You will be asked to "ENTER THE NUMBER OF LINES TO BE SAVED". Type in a number between 1 and 16, and then press <ENTER>. Next to be asked is, "ADD EPSON TRANSLATE CODE (Y/N)". If using an EPSON printer, answer "Y" for yes.

Now appearing will be "ENTER NAME OF FILE TO BE SAVED". Any standard TRSDOS file name is acceptable. After the file has been saved, the designate mode will return.

SELECTION NUMBER 2, LOAD DISK FILE TO SCREEN

When this selection is chosen, a file created under menu item number 1 will be loaded onto the screen. Be sure that that there are no valuable drawings on the screen when using this option.

When selecting option 2, you will be asked to "ENTER FILENAME TO BE LOADED". Type in the name of an existing file and press <ENTER>. The contents of the file will be loaded to the screen.

You may also load a section of a file created with Newscript into GEAP. When a file is loaded with the GEAP - Newscript Module, each line is looked at until a ".CM GEAP" is located. When this is encountered, the next 16 lines following the ".CM GEAP" will be placed on the screen. If a ".CM END" is found, the loading process ends.

Note that only the first 64 characters of the line will be loaded onto the GEAP screen.

Once module is "in place," press 'S' to access the Newscript Module commands.

11.2 SWITCHING BETWEEN NEWSCRIPT and GEAP

If planning to switch between NEWSCRIPT and GEAP, the following sequence should be used:

1) Insert the Newscript disk. When in "DOS READY", type "NS".
2) Now you will be able to run either GEAP or any of Newscript's functions by selecting the appropriate menu item.

If you wish to go to any of Newscript's functions when using GEAP, press the "I" and "O" keys at the same time to bring up the menu. Now choose selection 7, "RUN NEWSCRIPT". If step number 1 isn't completed first, Newscript will not function.

11.3 NOTES ON USING NEWSCRIPT WITH GEAP

Once you have created a Newscript-GEAP compatable file, you may do a myriad of things with it. Newscript's editor may be used to re-edit a GEAP created file, and/or you can used Newscript's printing facilities to print this file. Just treat the graphics file created with GEAP as a Newscript file.

GEAP'S SCREEN FORMAT vs NEWSCRIPT'S SCREEN FORMAT

The first thing to realize, is that GEAP'S screen format is, at this time, 64 characters across. Newscript's screen format allows up to 240 characters across. It is possible to move a GEAP created drawing anywhere within this 240 character boundary, however, when reloading a picture into GEAP for re-editing, only the first 64 characters of a line can be loaded onto the screen.

The second important thing to remember is: Newscript's viewing "window" is only 60 characters across. If you load a GEAP created file into the Newscript editor, only the first 60 characters will be seen. If you wish to see the last 64, you will have to use Newscript's "view" command. To do this, type: V 4,64
Some commands to review, associated with graphics in Newscript, are:
Format on, format off, translate, break, and join. To include a GEAP file within a Newscript file review the "IMBED" command and the "GET" file command.

All the other powerful Newscript commands may be used. However when dealing with graphic characters, you will find that some of the commands (as centering) should be used with caution. Be cautious with the INSERT command since the automatic word wrap around may break up your precious drawing.

OKIDATA MICROLINE PRINTER SUPPORT MODULE

The Okidata Microline 80 printer module is designed to allow the user to print GEAP creations. The module is relatively simple to use. When using it, follow the rules you would normally follow for any other GEAP Expansion Module.

To load this module, go to the designate mode, press the 'U' and 'O' keys at the same time. Next, select menu option 4, Okidata printer module. The module will then be loaded.

Whenever you wish to print something, press the 'P' key when in the designate mode. This module prints whatever is currently on the screen. After you press the "P" key you will be asked if you wish to change the current printer mode. This option allows you to change the various modes the Okidata Microline printer such as characters/line and lines per inch. Just answer the questions as they appear by selecting the approprate number.

The name of the Okidata Expansion Module on your disk is EXPMODP2. If you need more space on your disk, you may wish to delete the EPSON printer Module from your working disk (Be sure to keep it on your master disk in case you ever decide to buy an Epson). The name of the EPSON expansion module is EXPMODP1. To delete this you would go to DOS READY and then type KILL "EXPMODP1"

NEWSCRIPT PANEL JOINER by PROSOFT

By special arrangement with Prosoft, we have been able to include on your disk a program called JOINER. (Disk program name is "JOIN") Joiner allows you to combine several screen panels together to make a screen up to 255 characters across. For most of you graphic purposes, a screen format of 64 characters should be adequate, but in special cases, you will want to use the capabilities of Joiner.

One example of where you might want to use this program would be the following: Say you wanted to print in the condensed character mode (128 characters/line). The screen format of GEAP is 64 characters wide, so what do you do? You would then want to use Joiner. To create a screen format which is 128 characters wide, you would first create the left side and then save the file to disk using the designate 'FG' command. Next you would create the second half and do the same. Now call up the menu by pressing 'I' and 'O' at the same time, and select exit to basic. Now type RUN "JOIN" and press <ENTER>. The Joiner program will then run. Instructions for its use are included in the program. The resultant file that Joiner creates can then be loaded into NewScripts editing facilities just as any regular Newscript file. (You may wish to review Newscripts GET, IMBED, and VIEW commands). Remember that the file that Joiner creates cannot be loaded back into GEAP if it is greater than 64 characters, so

keep your original file intact until you are sure your edit is complete.

After you have "played" with JOINER, you will see the advantages of this method. Using a floor "tile" concept, you will be able to experiment with various placements of graphics panels without destroying your original. Since the files are on disk you may also wish to create a library of tiles and catalogue them for inclusion in other creations.

Graphics Editor and Programmer Instruction Manual (GEAP)

SUMMARY OF COMMANDS

Note: "Cursor" means the flashing mode indicator

Regular Mode (cursor = flashing dot)

Arrow(s)	Move cursor in indicated direction.
'Shift' and Arrow(s)	Draw line in indicated direction
'/' and Arrow(s)	Move designated figure in indicated direction.
'/' and 'Shift' and Arrow(s)	Draw, with designated figure as a "paintbrush".
';' and 'Enter'	Save screen to memory.
';' and 'Spacebar'	Load memory back to screen.
'Shift' and 'Spacebar'	Load temporary buffer to screen
'/' and 'Spacebar'	Load designated figure to screen.
'Clear'	Clear the screen.
'/' and 'Clear'	Erase the designated figure.
'9'	Call up menu of options.
','	Go to Keypad Mode.
'-'	Go to Designate Mode.
'*'	Go to Print Mode.

Print Mode (cursor = flashing asterisk)

Arrow	Move one space in indicated direction
Enter	Go to center of current line
@ and Arrow(s)	Move in indicated direction to corner or edge of screen.
@ and 'Enter'	Move to center of screen
'Clear'	Go to Keypad Mode
'Shift' and Arrow	Print picture of arrow.
'"' (quote)	Insert INPUT statement. Variable name follows quote. (If blank follows quote, default to A$).
Any other symbol	Print symbol hit and move to right.

Keypad Mode (cursor = flashing less-than sign)

Graphics Keypad	QW AS ZX	The keypad is defined as the six letters on the left side of the keyboard.
		Pressing any letter on the graphics keypad will turn on the corresponding dot at the left of the cursor. Pressing 'Shift' and letter of graphics keypad will erase the corresponding dot at left of cursor.
Arrow(s)		Move cursor in indicated direction.
'Shift' and Arrow(s)		Draw line of symbols like the one last entered with graphics keypad.
'/' and Arrow		Move entire screen in indicated direction.
'Enter'		Print cursor's current coordinates.
'Spacebar'		Draw horizontal line through cursor.
'9'		Call up menu.
'*'		Go to Print Mode.
'-'		Go to Designate Mode.
'.' (period)		Go to Regular Mode.

Designate Mode (cursor = flashing minus sign)

Arrow(s)	Move cursor in indicated direction.
'Shift' and Arrow(s)	Mark location with a '+' sign and move in indicated direction.
'Enter'	Record part of screen marked with '+' signs, and bring up designate, fill in, reverse, merge, and cancel options.
'Clear'	Erase '+' signs and start again to mark off screen.
'9'	Call up usual menu of options.
'<'	Go to Keypad Mode.
'*'	Go to Print Mode.
'.' (period)	Go to Regular Mode.
Other symbols	Go to expansion module if one is adjoined.

Menu (called with '9' key)

1) Store screen in PRINT statements. Picture stored is the one on the screen when the '9' key was hit.

2) Store figure in BASIC string. The designated figure is stored as a BASIC string. String that erases figure is also stored.

3) Dump storage. Prepare storage for recording. Also used to load pictures into GEAP, and to prepare for adjoining expansion modules.

4) Magnify figure. The designated figure is magnified by a factor of four (4X).

5) Tilt figure. The designated figure is tilted.

6) Four views of figure. Four symmetrical views of designated figure are drawn.

7) Rotate figure. The designated figure is rotated through an angle entered by operator. Has magnification option.

8) Shrink/Pull-Apart figure. The designated figure is pulled apart or shrunk. Two numbers are entered, one for the X-direction, one for the Y-direction. Numbers less than one shrink figure, numbers greater than one pull it apart.

9) Cancel. Return to picture.

NOTE: Menu options 2, and 4 - 8 will not operate until a figure has been designated. See Section 3.2

After saving stored pictures, it is not necessary to reload GEAP. See section 2.1, step 12.

ERROR MESSAGES

Message	Section of Manual
RECORDING . . . USING RESERVE STORAGE	4.2
TAKING 255 BYTES OF FIGURE	3.5
NEED MORE DATA	3.2
STORAGE OVERFLOW	4.2

SUMMARY OF COMMANDS
GEAP 48K DISK USERS

GENERAL COMMANDS
(These Commands are always "in residence").

'F' and 'G'	Calls up Save or Load Screen Image Command in Designate Mode
'I' and 'O'	Calls Up Menu with miscellaneous commands and Expansion Module: 1-5 options
'U' and 'O'	Calls up Menu to load User-Created Modules

(The commands listed below are "transient" commands. They are available from the Designate Mode after the specific module is loaded or "in place." The commands will not function if the module has not been loaded).

EXPANSION MODULE 1

'X'	Exchange long term and temporary storage contents
'S'	New designate, reverse, fill in and merge option
'M'	"Macro" magnification and rotation routine

EXPANSION MODULE 2 - Medium Letter Set

'M'	Go to Expansion Module 2
<CLEAR>	Exit mode

EXPANSION MODULE 3 - Large Letter Set

'L'	Go to Expansion Module 3
<CLEAR>	Exit Mode

EXPANSION MODULE 4 - Cube Letter Set

'C'	Go to Expansion Module 4
<CLEAR>	Exit Mode